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Institutional Barrier #7

Better Price Signals

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Draft conclusion:
Pricing strategies as alternatives to building transmission have limited effectiveness in the short term, but have considerable promise in the longer term. In the short term, we recommend consideration of

1. modification of the TBL's current demand charge for "Network Integration Service" (NT) customers to include a higher rate for peak use above historic levels, for sections of the transmission system that are stressed;
2. modification of TBL's contract fee for "Point to Point" (PTP) customers to reflect the marginal cost of serving increased loads;
3. adoption of a buyback program (such as interruptible contracts) designed to reduce the use of stressed components of the transmission system during periods of extreme peaks (e.g., a "Siberian Express");
4. modification of TBL's penalty for Bonneville's "Unauthorized Increase Charge" (UIC) for PTP customers who use more than their contracted capacity of the transmission system, to reflect the marginal cost to the transmission system of such use;
5. incentives for generators who locate close to loads, to reflect the actual cost to the transmission system of serving such generators; and
6. an additional charge during hours when sections of the transmission system are stressed, for customers placing load on these sections (critical peak pricing).

In the long term, more comprehensive pricing reforms should be pursued, taking account of issues described below.

In the meantime, a properly designed buyback can provide many of the same incentives for power users to moderate their demands on the transmission system. In this approach, customers are rewarded for reductions on peak rather than penalized for consumption on peak, but the economic incentives are comparable. Buybacks could take various forms such as an interruptible contract (the customer is committed to reduce load when the utility needs it) or a demand exchange (the customer can decide whether to respond to the utility's offer on each occasion). An interruptible contract is a more secure resource for the transmission system, but a demand exchange is likely to be more attractive to customers.

Discussion of issues. There are a number of issues to be addressed before price signals can play a significant part in postponing or substituting for transmission construction:

1. **Retail signals.** Bonneville pricing signals are necessary, but not sufficient in themselves to affect use of the transmission system. Retail prices, or equivalent incentives, will need to convey the signals to retail customers, where ultimate decisions are made as to when and how much energy is used. Bonneville prices give distribution utilities incentive to pass the signal through to customers, but the utilities may not do so for a variety of reasons.

   A strategy that uses transmission pricing as an alternative to transmission construction would need to include plans to change retail pricing or to provide equivalent incentives. The potential disconnect between wholesale (transmission) pricing and retail pricing is a good example of the institutional barriers that hinder progress toward non-construction alternatives.

2. **Meters.** For retail customers to respond to any signals of conditions whose duration is less than a billing period, they will need meters that can distinguish usage during periods of system stress from usage the rest of the time. Some customers have such meters, many don't.

3. **Dynamic pricing for transmission in the absence of other dynamic pricing**[1]. Ideally, prices for transmission would reflect the real time conditions of the system, which in most hours can accommodate all transmission requests. In most hours the appropriate price for transmission service is a traditional rate designed to recover investment. However, in some hours the system is congested (transmission requests cannot all be accommodated) and a higher price is appropriate.

   But congestion pricing for transmission doesn't seem practical in the absence of more general dynamic pricing. If we were thinking about adopting congestion pricing for transmission in a world with dynamic prices for energy already in place, it would be a marginal change for customers. The infrastructure for dynamic prices (meters, billing system, communication) would already be in place. Customers would be accustomed to responding to energy prices every day and they could respond to an occasional added congestion charge for transmission in the same way. But without the larger context of dynamic pricing for energy, it's hard to predict how customers would respond to a very occasional congestion charge applied in a limited geographical area.

4. **Demand charge for NT customers.** Demand charges are sometimes considered as an alternative to congestion charges, but they have their own problems. Demand charges can be expected to influence peak demand, but to be useful they need to affect transmission use in the right area at the right time (hours of particular stress on particular transmission system components). While the peak demand for the system may not always be in the same hour as the peak demand on the congested section of the system., the two peaks may usually be in the same hour. Further, the conditions that we're most concerned about are those that lead to extreme peaks (e.g. a "Siberian Express") and

[1] Prices that vary in real time with system conditions e.g. hourly

those conditions may make it even more likely that all components of the system peak at the same time.

If the hour at which the demand charge is determined matches, or approximately matches, the hour of peak load on the congested section, a "two-tiered" demand charge could be designed. It might charge, for example, $X/kW-month for peak loads up to the highest level observed historically for that customer utility but charge more, say $2X/kW-month for peak load that exceeds that level. This approach would not be as sophisticated as comprehensive dynamic pricing but would provide a useful signal during a period of consideration and development of a more extensive pricing reform.

An alternative to a tiered demand charge would be a fixed adder during hours when the section is congested. A fixed charge would not convey a price signal as precise as a congestion price, but its fixed nature would make it easier for customers to develop response strategies in advance. This alternative is similar to "critical peak" prices for energy.

5. **Price signals for PTP customers.** Point to point customers pay a fee ($1.028/kW-month) for a contracted amount of kW, and pay double the fee if they exceed the contracted amount (the Unauthorized Increase Charge). A customer can arrange to use a portion of another customer's contracted amount in the short term. Thus a customer that needs to use more than its contracted amount of transmission sees a price signal that gives it extra incentive to avoid asking for more service from Bonneville. However, the efficiency of the price signal depends on how well the doubled fee matches the cost to the transmission system of providing the service.

   To the extent that customers exchange short term rights to transmission in an active and competitive market, price signals are generated that give customers efficient incentives to reduce their use of the transmission system, even if they have unused contract rights. If the exchange market is not competitive, however, the prices will not provide efficient signals.

6. **Locational incentives for generators.** Generators are currently served under Bonneville's "Point to Point" (PTP) rates. They are charged higher than average rates if their service requires augmentation to the transmission system that costs more per MW than average rates. Generators whose marginal cost of service is lower than average rates are charged average rates[2], even though the marginal cost to the transmission system may be very low. Thus prices give generators incentive not to locate in places that will require high-cost improvements to the transmission system, but do not provide incentive for generators to locate in places that are particularly suitable to the system. A comprehensive system of dynamic prices would provide appropriate incentives to both categories of locations; in the absence of dynamic transmission prices, other incentives for the second category could be helpful.

[2] There is a "Short Distance Discount" that can be as much as 40 per cent, but the discount is determined by point to point circuit miles, not the actual marginal cost of service, which may not be correlated with circuit miles.

7. **Passage of time.** It will take time for us to accumulate the experience with prices to have confidence in the response. Over time, the response should increase as utilities learn how to translate wholesale prices into retail prices or incentives. Response should also increase over time as retail customers gain experience in adjusting their operations to price variation or incentives, and as customers make investments in equipment to enable them to respond more appropriately to price variation or incentives.

   As that experience accumulates, it may be practical to defer construction of added transmission capacity based on the expected response to prices. At our current level of experience, however, most planners would not have enough confidence in price response to support such a deferral of construction.